*CIA #6244*

*22-1-71*

*sent to State*

*Mrs C. Colbert*

## A Note on Gain/Loss Methodologies

### Statistics and the War

Since 1965 more effort has gone into developing statistical measures on the progress of the war in Indochina than in any other war in US history.  Statistics on pacification, battalion attacks, ammunition expenditures, Allied operations, and so forth are produced with mechanical regularity.  Computers absorb these data and stand at the ready to spew them back in milliseconds, massaged and manipulated in every way that trained and imaginative analysts can perceive.  Many of these statistical series have provided invaluable insights into how the war is progressing.  To cite one example: the series on infiltration of NVA personnel to South Vietnam has been for the past several years an extremely valuable indicator of Communist intentions, largely because we are confident that it is an extremely reliable series.  This cannot be said of many of the other statistical series on the war. Intelligence analysts who work most closely with these data soon come to realize that many series have biases, some unfathomable, some so severe that the series is not a reliable analytical tool.

In using almost any of the statistical measures bearing on enemy activities in Indochina it must be remembered that most are dependent on human judgments, or based on small samples, or are derived from tenuous methodologies.  Thus, when the analyst attempts to build even the most simple of "models" by inter-relating several of the series at once, cockeyed conclusions frequently become apparent.  One example that illustrates this problem and is described in this memorandum is the so-called "gain-loss" methodology for viewing the Communists' military manpower situation.

### Gain-Loss (or Input and Output Don't Match)

Analysts who have worked on the Communists' military manpower situation have undoubtedly mused at how simple life would be if they had the set of master ledgers that we imagine are kept by a slight bespectacled sergeant somewhere in COSVN.  On one side of his ledger are listed the "gains."
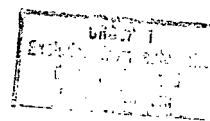
1. Infiltrators from North Vietnam.
2. Recruits obtained in South Vietnam.

On the other side of the ledger are listed the "losses":

1. KIA (the body count statistics)
2. All other losses, such as died of wounds,
   captured, desertions, retirements, and
   so forth.

With these data our sergeant periodically "balances the books" and for any period of time his balance shows whether the Communist forces in the field have grown or declined. The change in enemy strength that he calculates would also agree with a set of books kept by an adjacent sergeant who records the day by day strengths of all Communist forces in the theater and whose books would also show whether enemy forces had grown or declined during a given time period. Both sets of books would be compatible because they would have been prepared from the same authoritative daily morning reports from communist units.

The problem facing the US intelligence analyst is that we don't have the enemy's morning reports and our estimative set of books are not compatible; indeed, in many respects they are independent of each other. Over time, however, we have found that independent measures of the enemy's strength -- the OB accounting comparable to the books kept by our second sergeant in COSVN -- give better insights into the enemy strength trends than the gain/loss approach. Analysts throughout the community -- in CIA, DIA, and MACV -- have all come to realize that mechanically grinding through the gain/loss methodology can give grossly misleading results. Indeed, both DIA and MACV after adopting the gain-loss methodology as the authoritative approach for measuring trends in enemy strength have each had to abandon it and resort again to the "Order of Battle" approach.*

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* The independent measures of enemy force levels are derived by a number of different approaches. The classical approach is by unit by unit compilations based on captured documents and prisoner interrogations. Other methodologies use more estimatable approaches based on the organization of the enemy forces, and average unit strengths. Obviously, each approach has its own problems and a considerable margin of error. The "average battalion strength" approach as it is called has, however, proved to be a responsive indicator of changes in the size of the enemy forces in South Vietnam.

## Unbalanced Books

The best way of understanding the problems associated with the gain/loss approach is to run through the numbers for several years. First, 1968:

|  | In Thousands |
|---|---|
| Infiltration | 250 - 300 |
| Recruitment | 132 |
| Total gain | 382 - 432 |
| Losses | -310 |
| Net gain | +72 to +122 |

Thus the gain/loss methodology would tell us that the Communist forces in South Vietnam grew by from 72,000 to 122,000 personnel during 1968. However, our independently derived estimates for the same time period show that the enemy strength in South Vietnam declined by an estimated 30,000 to 40,000 personnel. Thus the gain/loss approach would have the enemy strength greatly increasing at a time when the best evidence makes it abundantly clear that the strength of the enemy forces had in fact decreased.

Moving on to 1969 and 1970:

|  | In Thousands | |
|---|---|---|
|  | 1969 | 1970 |
| Infiltration | 100 - 120 | 55 |
| Recruitment | 45 | 35 |
| Total gain | 145 - 165 | 90 |
| Losses | -288 | -202 |
| Net loss | -123 to -143 | -112 |

In 1969 the gain/loss analysis indicates that the Communist forces decreased by 123,000 to 143,000 and suffered a further decline of about 112,000 in 1970. In contrast, our independent estimates (the other set of books) shows that the declines in enemy strength were much less precipitous -- on the order of 60,000 men in

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in 1968 and about 45,000 men in 1970. Note the contrast
with 1968. In that year the gain/loss approach showed the
Communist forces increasing when they were actually de-
creasing. In the next two years both methodologies at
least show that the Communist forces are declining but
now the gain/loss methodologies show extravagant declines,
suggesting that net losses were more than twice those
indicated by our independent estimates. Thus, the gain/
loss approach shows one anomaly in 1968 -- greatly under-
estimating enemy losses -- and shows the converse in
1969 and 1970. Furthermore, slight changes in some of the
underlying assumptions behind the data can result in wide
swings in the final results. For these reasons the in-
telligence community has learned through hard experience
to view gain/loss analysis with the greatest of skepticism
and to reject it as an authoritative analytical tool.

## What's Wrong

Obviously, the books don't balance because for 1969
and 1970 losses are overstated or gains are understated
or some combination of these factors. A major share of
the "gain" factor is infiltration and we have already
said that this is probably our best single series on the
war. Recruitment, also a gain, is one of the worst series
but if it had indeed been great enough to balance our
equations, the intelligence community would almost cer-
tainly have been aware of it. This points the finger at
Allied estimates of total losses and suggests that for
1969 and 1970 they were much inflated. This doesn't
necessarily mean that the KIA (bodycount) estimate is
the exclusive culprit. We may be wrong on our estimates
of the number of Communists who die or are disabled of
wounds or be wrong in our estimates of such all embracing
categories as "other losses". However, if the over-
estimation of losses in 1969 and 1970 explains the reason
for our books not balancing, we must then consider
another vexing complexity. This is that in 1968, when
the gain/loss approach showed gains in enemy strength,
other intelligence makes it quite clear that Communist
losses were in fact underestimated.

This brief note on the perils of gain/loss analysis
or "why the books won't balance" undoubtedly leaves several
questions unanswered. It points up the fact, however,
that until we get better documentary information on the

- 4 -

SECRET

enemy's loss and gain statistics we are well advised to
discard this methodology and focus our energy on other
approaches which, whatever their shortcomings, are at
least compatible with the full take of intelligence in-
formation.

CIA/OER
22 January 1971

| TRANSMITTAL SLIP | DATE |
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| **TO:** | |

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**REMARKS:**

*Return to PVO OR file for 1971.*

**FROM:**

| ROOM NO. | BUILDING | EXTENSION |
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1 FEB 55

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WHICH MAY BE USED.

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*CIA Control No. 6244*

**MEMORANDUM FOR:** Mrs. Evelyn S. Colbert
Deputy Director, Office of
Research and Analysis
for East Asia and Pacific
Bureau of Intelligence and
Research
Room 7418, Dept. of State

Attached is the statement on gain losses methodology for you and David to consider. I regret the delay in getting it to you but other small things have interfered.

Deputy Director
Economic Research, CIA
22 Jan 71
(DATE)

**Attachment:**
As Stated.

25X1

FORM NO. 101
1 AUG 54

REPLACES FORM 10-101
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